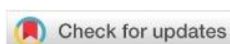


# Efforts to Improve High School Students' Table Tennis Skills Using Interval Training Methods

 Sarjono<sup>1</sup>,  Budi Setiawan<sup>2\*</sup>

<sup>1</sup>SMAN 3 Sukoharjo  
Jawa Tengah, Indonesia

<sup>2</sup>Universitas Pendidikan Indonesia  
Jawa Barat, Indonesia  
✉ [budi\\_setiawan@upi.edu](mailto:budi_setiawan@upi.edu) \*



## Article Information:

Received July 08, 2023

Revised August 06, 2023

Accepted August 10, 2023

## Keywords:

Interval Method; Proficiency;  
Table Tennis

## Abstract

The goal of this classroom action study was to help students in class XI IPA 4 semester 2 at SMA Negeri 3 Sukoharjo in the 2021/2022 academic year enhance their table tennis playing skills through the use of interval training. Students in the second semester of class XI IPA 4 in the 2021/2022 academic year will serve as participants in this action research in the classroom. The source of the data came from observations of table tennis training activities through the interval training method. Observational approaches, test forms, questionnaires, and point documentation were employed for data gathering. Data analysis techniques used cycle points consisting of two cycles with steps including planning, evaluation and reflection. The results showed that the interval training method in the game of table tennis carried out by the researcher showed the results of cycle 1: students' skills were in the moderate category 11 students, 14 students were lacking and 7 students were not very low. Cycle 2 results: showed student skills in the security guard category 13 students, category good 11 students and very good category 8 students. This is evident from the results of research conducted in two cycles, namely the results of hitting students right on target that have been determined to have increased from the test results cycle I with the results of the test cycle II.

## A. Introduction

Background of the study:

Physical education is a required part of the school curriculum that tries to improve students' health, fitness, critical thinking, emotional stability, social skills, reasoning, and moral action by means of sports and other physical activities.

Physical education plays a crucial role in the implementation of education as a process of human development that continues throughout a person's life by giving students opportunities to actively participate in a wide range of learning experiences through structured play, sports, and other forms of physical activity (Arnheim & Klafs, 1981). The goal of providing these educational opportunities is to encourage and shape a lifelong commitment to health and physical activity (Fox, 1998).

The goal of physical education is to promote healthy growth and development by providing an outlet for the cultivation of a wide range of skills, including motor, cognitive, affective, and social ones. Students who take PE will develop a range of skills that contribute to a positive impression of themselves and others,

including physical fitness, good lifestyle habits, and an awareness of human movement (Freeman, 1989; Noer, 1995; Harsono, 1988; Moeloek & Tjokronegoro, 1984; Josef, 1982).

Literature review:

Because of the multifaceted nature of the concepts that Physical Education teachers are tasked with inculcating in their students—ranging from fundamental movement skills to game and sports strategies to the internalization of values (sportsmanship, honesty, cooperation, etc.)—the process of learning Physical Education goes far beyond the confines of a purely theoretical classroom setting (Pate & Rotella, 1993; Sajoto, 1995; Soekarman, 1987; Soemarno, 1995). Putting a didactic-methodological spin on the activities you assign in the classroom is essential if you want your students to learn. Movement as a physical activity provides the foundation for humans to know the world and themselves, which naturally evolves in tandem with the times, hence no education is complete without Physical Education (Suharno, 1985; Sumosardjuno, 1994).

In an effort to meet students' needs for health the mental and physical benefits of sports and exercise, including improved cognitive function, emotional regulation, interpersonal competence, and ethical decision-making, table tennis learning activities which so far have only been taught by teachers through lecture and practice methods, one way to overcome this is the implementation of follow-up activities in the form of teaching by applying the simulation method (Beavan et al., 2020; Krakauer et al., 2019; Li et al., 2020; Vanneste et al., 2021; Veldman et al., 2020). This is intended so that students can easily understand and accept the material presented by the teacher and in the end the students will better understand and master the basic techniques of playing table tennis.

Gap analysis:

In the table tennis game learning activities, the average student has a high interest in the activity, but most students are still minimal and do not understand the basic techniques in table tennis game. For this reason, in order to improve students' abilities in playing table tennis, researchers who also serve as sports teachers try to provide guidance to students who take part in table tennis learning activities. The method used by researchers is using the interval training method.

The rationale of the study:

The guidance method used is to provide basic technical guidance in playing table tennis using a wall or board as a game opponent, with the help and direction of a mentor. The interval training method is a table tennis training program that is carried out at a predetermined time but interspersed with recovery.

Purpose or Hypotheses of the Study:

Based on the background of the problem above, it is interesting to study: "Efforts to Improve Table Tennis Skills Through the Use of Interval Training Methods in Class XI IPA 4 of 2<sup>nd</sup> Semester in SMA Negeri 3 Sukoharjo Academic Year 2021/2022.

## **B. Research Methods**

Population and the methods of sampling:

This study is an example of classroom action research conducted in accordance with established research protocols informed by the principles of Kemmis and Toggart (1988) actions that need planning, carrying out the plan, and then reflecting on and assessing the results. These four actions occur in cyclical patterns. This research was conducted from January 20<sup>th</sup>, 2021 to March 10<sup>th</sup>, 2022 for Physical Education teachers at SMA N 3 Sukoharjo.

The subjects of this study were students of Class XIIPA 4 Semester 2 SMA N 3 Sukoharjo for the academic year 2021/2022, in table tennis learning activities, with the consideration that students in this class have heterogeneous abilities. Students of this class prefer small ball practice. Few students are interested in table tennis practice. Therefore, the authors are interested in researching and improving students' ability to practice table tennis with an interesting method, namely the interval method. The number of students who were used as subjects was 32 students, consisting of 22 male students and 10 female students.

Scope and/or limitations of the methodology you used:

The data in this study were sourced from the interaction of teachers and students in the implementation of the table tennis training program using the interval method. Data collection is done by:

### 1. Observation Method

Careful and methodical observation is the method through which observation is carried out (Suharsimi, 1998). The researcher conducted observational data collecting in the sampling class to obtain an authentic description of interval training for table tennis.

### 2. Test Method

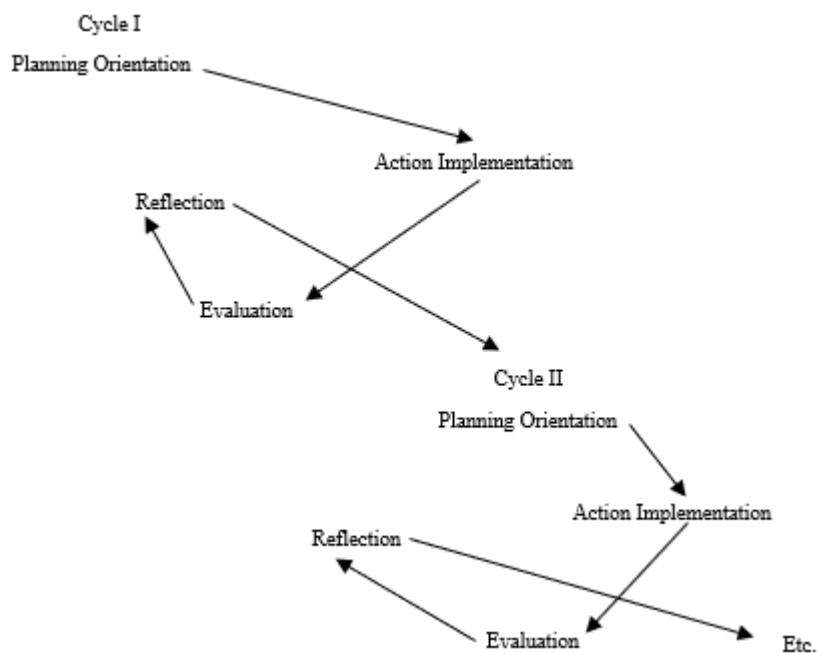
Suharsimi (1998) states "The test method is a series of statements or exercises or tools used to measure skills, knowledge, intelligence, abilities or talents possessed by individuals or groups". The test method used in this classroom action research is using the backboard test (Verducci, 1980)

### 3. Questionnaire

The questionnaire in this study was given to students to find out students' responses to the table tennis training program provided by the researcher whether it gave a feeling of pleasure or not.

### 4. Documentation Method

The term "documentation" refers to the process of acquiring knowledge or information through consulting relevant sources like books and archives. Class XI student information and names were retrieved from school records, as well as photos of the action research process. The data analysis technique in this study was collaborating with the Physical Education Orchestra subject teacher starting from the orientation stage followed by planning and the necessary preparations, implementing the actions in the first cycle, analytic discussions carried out after the implementation of the action, then reflecting on all activities that have taken place in the first cycle, to then plan the stages of modification, correction or correction, or improvement of learning in the second cycle, and so on. The analysis phase of the class action research can be described by the following steps.



**Figure 1.** Data Analysis Technique Scheme

## C. Result and Discussion

Results:

Description of Cycle I

### 1. Table Tennis Guided Workout Plan

The guidance training model with a training program using the interval method in table tennis for students of Class XI IPA 4 Semester 2 SMA Negeri 3 Sukoharjo for the 2021/2022 academic year is planned for Cycle I, with the following planning:

- a. The teacher determines the time to carry out the exercise which is located in the school yard. The class is then split into six groups of five or six individuals.
- b. The teacher makes an exercise guide when giving guidance which will be given to each class.
- c. The teacher has set the frequency of practice for each group.
- d. The teacher prepares observation and observation sheets.

## 2. Implementation of Teaching

After planning activities in Cycle I, the next step is to carry out training activities for research. The implementation date from 27-01-2021 to 10-02-2021 is as follows.

### a. Initial activity:

- 1) The educator suggests extracurricular settings for students to hone their skills.
- 2) The instructor calls on the pupils to assemble in their respective groups.
- 3) The instructor extends a warm greeting.
- 4) The instructor encourages the class to think on the value of living a healthy lifestyle.
- 5) The instructor provides each class with a practice manual.
- 6) The instructor describes the interval training method and how it is used in the table tennis training program.

### b. Core activities:

- 1) Each student warms up before doing the exercise.
- 2) Furthermore, the teacher guides in doing table tennis exercises.
- 3) After the exercise, students are asked to reconvene the exercise.
- 4) Within a time limit of no more than 15 minutes, the instructor leads a conversation to which the students are invited to respond.

### c. End activities:

- 1) The instructor encourages pupils to discuss challenges they face while working out.
- 2) The instructor draws inferences with the class. The lesson concludes with a greeting from the instructor.

## 3. Student Proficiency Test Results in Playing Table Tennis

Based on the results of the training activities in cycle I, the following are the results of students' proficiency tests in playing table tennis in Class XI IPA 4 Semester 2 SMA Negeri 3 Sukoharjo Academic Year 2021/2022.

**Table 1.** Table of Student Proficiency Test Results Table in Playing Table Tennis  
Cycle I in Class XI IPA 4 Semester 2 SMA Negeri 3 Sukoharjo Academic Year 2021/2022  
(Passing Grade: 75)

No	Name	Test Result	Note
1	Ahmad Nori Prasetyo	76	Fair
2	Baskara Petar	78	Fair
3	Ronny Indra	78	Fair
4	Alwi Pratama	77	Fair
5	Bima Triatmaja	77	Fair
6	Dhimas Banu	77	Fair
7	Faizal Aji	78	Fair
8	Claudia Candra	78	Fair
9	Devita Sri Rahmawati	78	Fair
10	Ridwan Asari	71	Low
11	Zainal Arifin	77	Fair
12	Bayu Adi Nugroho	78	Fair
13	Dian Sanusi	70	Low
14	Imam Ibnu	71	Low
15	Ika Wuryandari	69	Low
16	Tomi Harmoko	71	Low
17	Yoga Purwa	70	Low
18	Evi Nur Cahyani	70	Low

No	Name	Test Result	Note
19	Anggi Bagas	71	Low
20	Eko Yuniawan	71	Low
21	Heri Kiswanto	69	Low
22	Mita Kurniawati	70	Low
23	Putri Enggal	70	Low
24	Hesti Febriyanti	72	Low
25	Bagus Radyatama	70	Low
26	Gilar Prasetyo	68	Very Low
27	Imam Danu	68	Very Low
28	Irvan Iqbal	68	Very Low
29	Novita Arsita	68	Very Low
30	Muh. Ibrahim	68	Very Low
31	Roni Fadilah	68	Very Low
32	Sari Ramadani	68	Very Low

Evaluation Description:

a. Assessment Guide

- 1) The result of each trial is the number of valid bounces for 30 seconds.
- 2) The best trial results are the test scores.

b. Norm

The score of skill in playing table tennis:

**Table 2.** Table of Table Tennis Playing Skill Score

Score	Category
86- Up	Very Good (VG)
80-85	Good (G)
75-79	Fair (M)
69-74	Low (L)
68-under	Very Low (VL)

Table tennis competence tests administered in cycle I utilising the interval training method revealed the following: 11 students performed at a moderate level, 14 students performed at a poor level, and 7 students performed at a very poor level.

4. Observation / observation activities:

Observation / observation activities carried out simultaneously with training activities carried out by researchers. The things observed include:

- 1) Sequence of the steps for carrying out the exercise  
Based on the observations / observations made by the author of the sequence of steps for implementing table tennis training activities with interval method training, they have gone well and are in accordance with the planning of training activities.
- 2) Student activities  
The results of observations/observations on student activities showed that students were not yet skilled at carrying out beating exercises.
- 3) Teacher activity in managing the training program  
The observations showed that the teacher's activity in managing table tennis training program activities was good, namely the teacher's function was only as a motivator, meaning that the teacher was a guide so that students practiced actively, creatively and intimately.
- 4) Table Tennis Proficiency Test Results  
Based on the results of the student proficiency test in playing table tennis, the results were still lacking.  
Improvements in exercise implementation in cycle II are required in light of what was learned in cycle I about the execution of actions and the outcomes produced by students. These constraints include time (since much time is wasted) and the fact that students' attention is easily diverted.

## Description of Cycle II

### 1. Teaching Plan

The outcomes of the first cycle's discussion are taken into account during the second cycle's action planning:

- Set more exact times for practise.
- Draught manuals for conducting guided exercises.
- Time management is key to avoiding unnecessary delays.
- Using a loudspeaker (e.g., a loudhailer) to get everyone's attention.
- Different configurations of student groups are used to ensure that students of all skill levels are working together.

### 2. Execution of Exercise

The implementation of learning using the interval method in table tennis games for students of Class XI IPA 4 Semester 2 SMA N 3 Sukoharjo for the 2021/2022 academic year will be held from 17-02-2021 to 10-03-2021 as follows:

#### a. Initial activity

- The class is called to the practise area right away and pupils are invited to come.
- The instructor calls on the pupils to assemble in their respective groups.
- The class is welcomed and the activity is opened.
- The instructor's encouragement contributes to a rise in students' interest.

#### b. Core activities:

- The teacher guides students during practice activities.
- After a set amount of time, the instructor will have the class meet up again to discuss the activity's outcomes.
- Within the specified period of 25 minutes, the teacher leads a conversation in which students have the chance to respond.

#### c. End activities

- The educator encourages pupils to discuss challenges they face while carrying out the activity.
- The instructor draws inferences alongside the class.

### 3. Student Proficiency Test Results in Playing Table Tennis

Based on the results of the training activities in cycle II, the following are the results of the student proficiency test in playing table tennis in Class XI IPA 4 Semester 2 SMA Negeri 3 Sukoharjo Academic Year 2021/2022.

**Table 3.** Table of Student Proficiency Test Results in Playing Table Tennis Cycle II  
In Class XI IPA 4 Semester 2 SMA Negeri 3 Sukoharjo Academic Year 2021/2022  
Passing Grade: 75

No	Name	Test Result	Note
1	Ahmad Nori Prasetyo	87	Very Good
2	Baskara Petar	88	Very Good
3	Ronny Indra	87	Very Good
4	Alwi Pratama	82	Good
5	Bima Triatmaja	82	Good
6	Dhimas Banu	82	Good
7	Faizal Aji	79	Fair
8	Claudia Candra	82	Good
9	Devita Sri Rahmawati	82	Good
10	Ridwan Asari	77	Fair
11	Zainal Arifin	78	Fair
12	Bayu Adi Nugroho	87	Very Good
13	Dian Sanusi	78	Fair
14	Imam Ibnu	82	Good
15	Ika Wuryandari	88	Very Good
16	Tomi Harmoko	77	Fair

No	Name	Test Result	Note
17	Yoga Purwa	90	Very Good
18	Evi Nur Cahyani	79	Fair
19	Anggi Bagus	82	Good
20	Eko Yuniawan	83	Good
21	Heri Kiswanto	77	Fair
22	Mita Kurniawati	82	Good
23	Putri Enggal	78	Fair
24	Hesti Febriyanti	77	Fair
25	Bagus Radyatama	87	Very Good
26	Gilar Prasetyo	79	Fair
27	Imam Danu	86	Very Good
28	Irvan Iqbal	82	Good
29	Novita Arsita	79	Fair
30	Muh. Ibrahim	82	Good
31	Roni Fadilah	77	Fair
32	Sari Ramadani	78	Fair

Evaluation Description:

a. Assessment Guide

- 1) The result of each trial is the number of valid bounces for 30 seconds.
- 2) The best trial results are the test scores.

b. Norm

The score of skill in playing table tennis:

**Table 4.** Table of Table Tennis Playing Skill Score

Score	Category
86- Up	Very Good (VG)
80-85	Good (G)
75-79	Fair (M)
69-74	Low (L)
68-under	Very Low (VL)

Based on the results of the evaluation of students' proficiency tests in playing table tennis using the interval training method in cycle II, it showed that 13 students were in the moderate category, 11 students in the good category, and 8 students in the very good category, so it can be concluded that the use of the interval training method can improve the skills of playing table tennis in students of Class XI IPA 4 Semester 2 SMA Negeri 3 Sukoharjo Academic Year 2021/2022.

4. Observation / observation activities:

The results of the second cycle's observational activities revealed a number of positive shifts in the kids' attitudes, comprehension, and table tennis abilities. Based on the results of the student proficiency test in playing table tennis, most of the students were in the good category.

The results of the implementation of individual training guidance in the 2nd cycle showed that students' skills in playing table tennis had increased.

Discussion:

A. Questionnaire Results

Based on the findings of the data from the student questionnaire sheets during the exercise activities, it can be said that students feel happy with the exercise activities given by the teacher. The statement above is supported by the findings or as follows.

**Table 5.** Opinions of students about table tennis training activities

No	Criteria	Frequency	Percentage
1	Very Interesting	22	68,75%
2	Fair Interesting	8	25,00%
3	Less Interesting	2	6,25%



No	Criteria	Frequency	Percentage
	Total	32	100%

Based on the table above it shows that students stated that table tennis training activities were very interesting as many as 22 students or 68.75%, quite interesting as many as 8 students or 25% and less attractive as many as 2 students or 6.25%. So, it can be concluded that the students' opinions regarding table tennis practice, some students stated that it was very interesting.

**Table 6.** The Method of Training and Guidance for Playing Table Tennis is Said to be a Playing Activity

No	Criteria	Frequency	Percentage
1	Definitely Agree	19	59,38%
2	Agree	12	37,50%
3	Disagree	1	3,13%
	Total	32	100%

Based on the table above, it shows that students stated that training and guidance on playing table tennis was said to be an activity while playing sports, namely students stated that they strongly agreed as many as 19 students or 59.38%, agreed as many as 12 students or 37.50% and disagreed as many as 1 student or 3.12%.

**Table 7.** Opinions of 6 Students about the Interval Training Model in Table Tennis Games

No	Criteria	Frequency	Percentage
1	More Playing	5	15,62%
2	More Practice	9	28,13%
3	Balance between playing and practice	18	56,25%
	Total	32	100%

Based on the table above, it shows that students stated the interval training model in table tennis games, namely playing more by 5 students or 15.62%, more practicing by 9 students or 28.13% and balanced between practicing and playing by 18 students or 56.25%.

#### D. Conclusion

Research into the effectiveness of interval training in table tennis games among students in Class XI (Eleven) IPA 4 Semester 2 SMA Negeri 3 Sukoharjo Academic Year 2021/2022 has showed positive results. This is supported by the findings of a two-stage study, the first of which found that 11 pupils had moderate skills, 14 had fewer skills, and 7 had very few abilities. Cycle 2 data showed that the majority of students' abilities fell into the "moderate" range, while 13 scored in the "good," "very good," or "excellent" ranges, respectively. The student's hitting outcomes are thus spot on, as shown by the fact that they improved between the first and second cycles of testing.

#### E. Acknowledgement

I would like to say our thankfulness to SMA 3 Sukoharjo for the financial and support and also the permission to conduct this research.

#### References

- Arnheim, D. D., & Klafs, C. E. (1981). *Modern Principles of Athletic of Training*. C.V. Mosby Company.
- Beavan, A., Spielmann, J., Mayer, J., Skorski, S., Meyer, T., & Fransen, J. (2020). The rise and fall of executive functions in high-level football players. *Psychology of Sport and Exercise*, 49, 101677. <https://doi.org/10.1016/j.psychsport.2020.101677>
- Fox, E. L. (1998). *The physiological basis of physical education and athletics*. Holt Wb Saunders Company.
- Freeman, W. H. (1989). *Peak When It Count*. Tafhews Press.
- Harsono. (1988). *Choaching dan Aspek-Aspek Physiologis Dalam Choaching*. Depdikbud. Dierjendikti.
- Josef, N. (1982). *General Theory of Training*. Pan African Press.
- Krakauer, J. W., Hadjiosif, A. M., Xu, J., Wong, A. L., & Haith, A. M. (2019). Motor Learning. *Comprehensive Physiology*, 9(2), 613–663. <https://doi.org/10.1002/cphy.c170043>
- Li, L., Zhang, J., Cao, M., Hu, W., Zhou, T., Huang, T., Chen, P., & Quan, M. (2020). The effects of chronic physical activity interventions on executive functions in children aged 3-7 years: A meta-analysis.



- Moeloe, D., & Tjokronegoro, A. (1984). *Kesehatan dan Olahraga*. Fakultas Kedokteran Universitas Indonesia.
- Noer, A. H. (1995). *Ilmu Kepeleatihan Dasar*. Universitas Terbuka.
- Pate, R. R., & Rotella, B. M. R. (1993). *Dasar-Dasar Ilmiah Kepeleatihan*. IKIP Semarang Press.
- Sajoto, M. (1995). *Peningkatan & Pembinaan Kekuatan Kondisi Fisik dalam Olahraga*. Dahar Press.
- Soekarman. (1987). *Dasar Olahraga untuk Pembina, Pelatih, dan Atlet*. Inti Idayu Press.
- Soemarno. (1995). *Materi Pokok Olahraga Pilihan (Tenis Meja)*. Depdikbud.
- Suharno. (1985). *Ilmu Kepeleatihan Olahraga*. FPOK IKIP Yogyakarta.
- Suharsimi, A. (1998). *Metode Penelitian Suatu Pendekatan Praktik*. Rineka Cipta.
- Sumosardjuno, S. (1994). *Pengetahuan Praktis Kesehatan Dalam Olahraga*. Gramedia.
- Vanneste, P., Raes, A., Morton, J., Bombeke, K., Van Acker, B. B., Larmuseau, C., Depaep, F., & Van den Noortgate, W. (2021). Towards measuring cognitive load through multimodal physiological data. *Cognition, Technology & Work*, 23, 567–585. <https://doi.org/10.1007/s10111-020-00641-0>
- Veldman, S. L. C., Jones, R. A., Stanley, R. M., Cliff, D. P., Vella, S. A., Howard, S. J., Parrish, A. -M., & Okely, A. D. (2020). Promoting Physical Activity and Executive Functions Among Children: A Cluster Randomized Controlled Trial of an After-School Program in Australia. *Journal of Physical Activity & Health*, 17(10), 940–946. <https://doi.org/10.1123/jpah.2019-0381>
- Verducci, F. M. (1980). *Measurement concepts in Physical Education*. St. Louis Missouri: Mosby Company.

---

**Copyright Holder**

© Sarjono, S., & Setiawan, B.

**First publication right :**

Dikdimas: Jurnal Pengabdian Kepada Masyarakat

This article is licensed under:

